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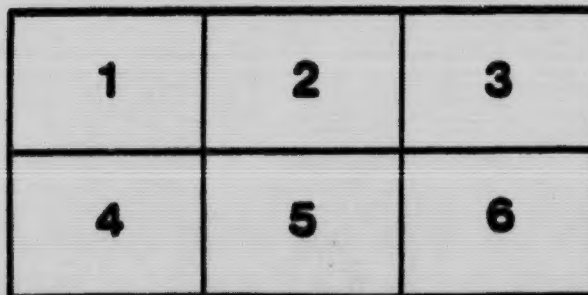
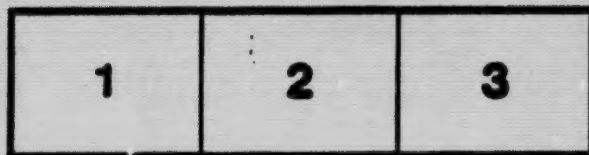
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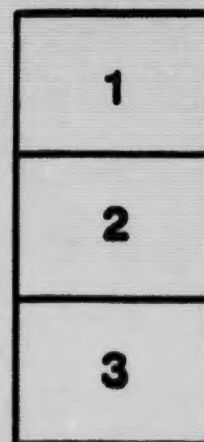
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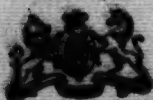
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3// **REPORT**
ON THE
**Mineral Statistics and Mines
of Newfoundland**

By
JAMES P. HOWLEY, F.G.S.
for the Year 1900



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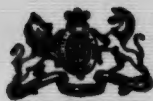
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R. J. Salter Esq.

REPORT
ON THE
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of Newfoundland

By
JAMES P. HOWLEY, F.G.S.
for the Year 1900



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REPORT

Annual Report of the
U. S. Fish Commission

1901

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REPORT

ON THE

**Mineral Statistics and Mines of Newfoundland for
the Year 1900, by James P. Howley, F.G.S.**

St. John's, N. F.,
May 20th, 1901.

ELI DAWE, Esq.,

Minister of Agriculture and Mines,—

SIR,—In reporting upon the mineral development and statistics of the Island for the past couple of years I took occasion to express my obligations to all those individuals who so kindly furnished me with the necessary information to enable me to compile these reports. Had it not been for their co-operation, any attempt to furnish accurate information upon this important and growing industry would be futile. Seeing that as we have no mining inspection in this country, and no special department charged with the collection and arranging of mining data, it would be impossible to place before the world a truthful and reliable statement of what we are doing in that line without the voluntary assistance of those actually engaged, or otherwise interested in the development of the mineral resources of the Colony.

Some few individuals still exhibit a reluctance to make public that which they consider nobody's business but their own, but their numbers are diminishing each year, and the majority seem perfectly disposed to furnish any information asked for.

I have again to thank the following gentlemen to whom I am indebted for much of the material contained in the following report, viz.: Mr. Williams, manager of the Tilt Cove Mine, Mr. C. R. Rendell, Bett's Cove Mine, Mr. Hooper of the York Harbor Mine; the managers of the Dominion and Nova Scotia Steel Co.'s Mines at Bell Island, Messrs. Harvey & Co., Job Bros., R. Rendell, W. Ellis, C. Taylor and several others.

While the year 1900 witnessed considerable activity in the search for minerals, and a good deal of development work was carried out in various directions, no new producer was added to the list. There was consequently a considerable falling off in the amount and value of the total quantity of ore mined and shipped from the Colony, in comparison with that of the previous year.

The chief causes which operated in bringing about this result were the closing down of the Pyrites Mine at Pilley's Island, Notre Dame Bay, and the suspension of work on the Coal seams at Grand Lake, which together represented at least \$150,000 decrease. These figures would have been made good by the increased output of Iron ore from the Bell Island mines had not the prolonged strike amongst the miners, which occurred in the height of the shipping season last summer, resulted in the total suspension of work for a period of nearly two months, and caused the cancelling of several large orders for ore. It will be seen by the returns that the total output for the two companies only exceeded that of the Nova Scotia Co., alone for the previous year by a little over 10,000 tons.

On the other hand it is pleasing to learn that the Slate industry in Trinity Bay has been revived, and that a small shipment of 600 tons was made during last summer to the London market with favorable results. It is also a pleasure to be able to record the fact that several abandoned mining properties are now being reopened with a view to further testing them. The Newfoundland Exploration Company have taken over the old Terra Nova Mine at Bay Vert, also the Pilley's Island Pyrites Mine, both of which they are making preparations to reopen the present season. The Cape Copper Co. have secured an option upon the Stocking Harbor Mine, and will probably develop it this summer. Thompson & Co., mined about 120 tons of Copper ore from the Colchester property last summer, and have men at work all winter on the Little Bay Mine. The Newfoundland Copper Concentrating Co., are engaged at the Bett's Cove Mine, and are now driving a tunnel from the water-side in towards the old workings with a view to unwater the mine, and get out the ore still believed to exist in quantity below the original excavations, but which was rendered unreclaimable some years ago owing to caving in of the entire roof of the mine. The low price of copper at that time, and the great expense which it would entail to drive underneath the old working, necessitated the abandoning of the mine in 1885. The present high price of copper has stimulated the original owners to attempt reopening it.

Mr. William Cook has men employed doing some further development on his Manganese Claim at Fortune Harbor, Notre Dame Bay, and Capt. Stewart is engaged sinking upon the Arsenic-

al Pyrites lode opened up some years ago at Moreton's Harbor, New World Island, N. D. B.

The Batt's Hill Copper Mine in Conception Bay, now being tested, is according to reports promising well.

Several new and no doubt some valuable mineral finds have been made during the past season, and there is reason to believe that the Coal seams of Bay St. George and the vast bodies of Magnetite in the same region are likely at length to receive the attention their importance deserves. Here we have the nucleus of a similar gigantic industry to that which the Whitney Syndicate have established at Sydney, Cape Breton, awaiting the application of capital to set it in motion.

Quite recently the low grade Manganese deposits on the South side of Conception Bay which for many years have been regarded as of no commercial value, are attracting considerable attention, and are now about to be developed by the Dominion Iron & Steel Co. The adaptability of this class of ore for the production of ferro-manganese and spiegeleisen two substances now largely used in the manufacture of the best qualities of steel, is the desideratum which has brought it into requisition.

Should a portion only of these new ventures, now being exploited, become actual producers in the near future, we may look forward to a greatly increased output, and a consequent increase in the money value of our mineral products.

The promise which the country gives of possessing economic mineral wealth of no ordinary character, has long been recognised, and is now amply borne out by actual experiment. The failure of pioneer effort, so frequently attending the earlier attempts at mining, here as elsewhere, should not be regarded as evidence of a negative character. Such failures are frequently followed by ultimate success, and, taking it altogether, mining enterprise, when conducted upon business and systematic principles, by persons qualified and experienced in such undertakings, presents really no greater risks than any other form of speculation.

It has been proved by statistics, that in proportion to the amount of capital invested, and the number of individuals employed therein, no other industrial enterprise shows anything like as favorable results. In the United States of America, the dividends paid through mining investment exceed those of all other indus-

tries combined. There is nothing to compare with the mineral products of a country, fortunate enough to possess such, for the increasing of its solid national wealth. Most other products are consumed, and after a little while their effect upon those enterprises which tend to keep the progress of the world in motion, and prevent stagnation is a thing of the past, not so with the minerals won from mother earth. With very few exceptions those products remain in the shape of colossal structures, or works of utility, art, &c., for generations.

If then we are convinced that we possess an abundance of these undeveloped natural resources, I would respectfully submit that the time has come when we should bring more intelligent effort to bear upon the question of how best to exploit and encourage legitimate mining enterprise.

I am more and more impressed each year that the future prosperity of this country will depend in a great degree upon the manner in which its mineral development is dealt with.

The establishment of a Mining Bureau, such as they possess in Canada and most of the states of the American Union, whose object is to collect data, inspect mining properties, explore and trace out any new and important finds, assay specimens both for the state and individuals, furnish all possible information of a useful character to those requiring it, and above all place the Government in a position to formulate the necessary legislation to effect the desired end, would I imagine be a subject worthy of consideration.

At the close of the last calendar year printed forms such as those suggested in my report for 1898, were sent out to the managers of the several mines in active operation, with a request to have them filled in and returned to this department. Nearly all these requests were complied with, and the following very full particulars, which will, I doubt not, prove interesting have been furnished me.

The other information contained in the summary of mineral products for the year 1900, as set forth in tabular form, was derived from various sources, chiefly from parties in the city who were connected with some or other of these minor enterprises, or who were in a position to afford reliable data.

REPORT FOR 1900.

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MINES AND MINERAL STATISTICS. No. I.

Name of Mine and Character of Product.	Quantity of Ore raised.	Manuf'd or used in Country.	Exported to what Market.	Val. of Crude Material at Mine.
UNION MINE, TILT COVE.				
Copper Ore East Mine.....	Tons. 66,250	None.	32,758 to Swansea	\$ 331,250
West Mine Copper Ore	3,144	do.	30,301 to New York	151,505
Fines	600	do.	3,900 to Swansea	58,400

NO. OF PERSONS EMPLOYED IN AND ABOUT MINES. No. II.

Above Ground.	Below Ground.	Totals.
Engineers and Smiths24	Miners106	
Laborers on Surface.161	Trammers..... 53	
Boys do. do. 32		
217	159	376

NUMBER AND KIND OF ACCIDENTS. No. III.

Name of Individual	Occupation	Nature of Accident	Remarks.
John Winsor.....	Miner.	Killed by falling	The Company generously donated the families of these men £100 and £150 stg.
William Cooper ...	do.	of earth and	
Nathanael Mills ...	do.	Rock.	

MINES AND MINERAL STATISTICS.

No. I.

Name of Mine and Character of Product.	Quantity of Ore raised	Manuf'd or used in Country.	Exported to what Market.	Value of Crude Material at Mine.
BLO-MI-DON MINE, York Harbor, BAY OF ISLANDS.				
Copper Pyrites.....	500	None.	None.	\$ 12,000

NO. OF PERSONS EMPLOYED IN AND ABOUT MINES.

No. II.

Above Ground.	Below Ground.	Totals.
13	14	26

NUMBER AND KIND OF ACCIDENTS.

No. III.

Name of Individual.	Occupation	Nature of Accident	Remarks.
		None.	

REPORT FOR 1900.

MINES AND MINERAL STATISTICS. No. I.

Name of Mine and Character of Product.	Quantity of Ore raised.	Manufactured or used in country.	Exported to what Market.	Value of Crude Material at Mine.
NOVA SCOTIA STEEL COMPY. GREAT BELL ISL. Hematite Iron Ore	Tons. 137,791	None.	Philadelphia, U.S. and Pictou, N.S.	\$ 127,791

NO. OF PERSONS EMPLOYED IN AND ABOUT MINES. No. II.

Above Ground.	Below Ground.	Totals.
300	None.	300

NUMBER AND KIND OF ACCIDENTS. No. III.

Name of Individual.	Occupation.	Nature of Accident	Remarks.
		Fracture of Fibula do. Tibia do. Lmaxilla do. 2 ribs do. do. do. do. do. 2nd Metacarpal bone Amput. 1 Finger do. do. Scalp wounds Injuries from falling of Ore Injuries to cornea due to particles of Ore	None Fatal.

MINES AND MINERAL STATISTICS.
No. I.

Name of Mine and Character of Product.	Quantity of Ore raised.	Manuf'd or used in Country.	Exported to what Market.	Value of Crude Material at Mine.
WABANA MINE GREAT BELL ISL. Hematite Iron Ore	Tons. 189,425	None.	Sydney, Cape Breton.	• 189,425

NO. OF PERSONS EMPLOYED IN AND ABOUT MINES.
No. II.

Above Ground.	Below Ground.	Total.
965	None.	965

NUMBER AND KIND OF ACCIDENTS.
No. III.

Name of Individual.	Occupation.	Nature of Accident	Remarks
Thomas Shannahan.	Miner.....	Blasting Accident.	Recovered.
Alfred Pike.....	Watchman.....	Fracture both legs	do.
Mark Lee	Labourer.....	Simple "Humerus	do.
Thomas Craig.....	Trackman.. ...	Pott's Fracture....	do.
Joseph Butler.....	Engine-r. help	Severe Scalp W'ds	do.
John Martin	Labourer	Pott's Fracture....	do.
Eli Brown	Not Employed	Compou'd Fract're	do.
Michael Burke	Labourer	Severe Lacer. Knee	do.

**MINES AND MINERAL STATISTICS.
No. I.**

Name of Mine and Character of Product.	Quantity of Ore raised.	Manuf'd or used in Country.	Exported to what Market.	Value of Crude Material at Mine.
SLATE QU'RY Smith's Sound TRINITY BAY.				
Slate.....	Tons. 600	Tons. 600	Lon. Gt. Brit'n.	\$ 10,800

**NO. OF PERSONS EMPLOYED IN AND ABOUT MINES.
No. II.**

Above Ground.	Below Ground.	Totals.
50	None.	50

**NUMBER AND KIND OF ACCIDENTS.
No. III.**

Name of Individual	Occupation	Nature of Accident.	Remarks.
		One man had ankle hurt, sent to hospital.	Recovered.

MINES AND MINERAL STATISTICS. No. I.

Name of Mine and Character of Product.	Quantity of Ore raised.	Manuf'd or used in Country.	Exported to what Market.	Value of Crude Material at Mine.
NFLD. BRICK & TILE CO., Random Island, TRINITY BAY.				
Bricks.....		800,000	None.	\$ 11,300

NO. OF PERSONS EMPLOYED IN AND ABOUT MINES. No. II.

Above Ground.	Below Ground.	Totals.
35	None.	35

NUMBER AND KIND OF ACCIDENTS. No. III.

Name of Individual.	Occupation.	Nature of Accident.	Remarks.
		None.	

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Comparative table of the Mineral production for the past five market prices ruling during each year. In the case of the metallic contents, while for the non-metallic, I have assumed a valuation based on the prevailing market prices, where it could be ascertained.

TABLE

Character of Product.	1896.		1897.		1898.
	Quantity.	Value.	Quantity.	Value.	Quantity.
	Tons.	\$	Tons.	\$	Tons.
Asbestos	M	2,600	M		M
Brick	870,000	7,570	870,000	7,570	870,000
Building Stone	500 t	500	500 t	500	600 t
Chromite	1,014 t	15,210	3,033 t	42,462	724 t
Coal					2,900 t
Cobble Stone		500		500	
Copper	2,328½ t	584,325	2,518½ t	690,384	2,407½ t
Gold	3,000 oz.	62,010	3,000 oz.	62,010	2,783 oz.
Granite	120 t	1,008	120 t	1,008	4,000 t
Iron	20,375 t	230,201	30,786½ t	347,400	55,000 t
Manganese			1,500 t	18,000	
Mica					
Paving Stone					1,700 t
Pyrites	27,274 t	190,918	32,790 t	229,535	32,335 t
Silver	4,000 oz.	2,684	4,000 oz.	2,684	2,616 oz.
Slate	3,000 sq.	1,350	300 sq.	1,350	300 sq.
Grand Total		1,098,276		1,403,407	

M. Thousand.

t. Ton of 2,240 lbs.

sq. Squares.

oz. Ounce.

*E

last five years, from 1896 to 1900, both inclusive, based upon the average metallic minerals, these are calculated upon the final value of their metallic content based upon the selling price of these materials in the local and foreign

TABLE III.

1898.		1899.		1900.		Total Value
Quantity.	Value.	Quantity	Value.	Quantity	Value.	
Tons.	\$	Tons.	\$	Tons.	\$	\$
M		M		M		2,000 00
10,000	7,570	772,000	8,464	800,000	11,200	41,374 00
600 t	900	500 t	500	500 t	500	2,900 00
724 t	15,457	706 t	10,399			83,528 00
2,900 t	11,600	5,000 t	20,000			31,600 00
	500	500 t	500	500 t	500	2,500 00
1,407 t	656,741	2,955 t	1,165,757	2,882 t	1,045,387	4,142,594 00
1,783 oz.	57,525	2,075 oz.	42,890	2,400 oz.	49,608	274,043 00
4,000 t	20,000	100 t	500		2,500	25,016 00
55,000 t	712,200	165,633 t	2,650,128	177,584 t	2,841,348	6,781,286 00
						18,000 00
		23 t	660			660 00
1,700 t	13,600	3,512 t	28,100			41,700 00
32,335 t	220,345	26,154 t	183,078			829,871 00
2,616 oz.	1,543					6,911 00
300 sq.	1,350			600 sq.	10,800	14,850 00
	1,725,331		4,110,976		3,961,843	12,298,833 00

*Estimated from average yield per ton of ore smelted, which is given as 1.5 dwts. fine gold worth \$20.67 per ounce.

It will be seen by the following tables that the total value of the mineral products for the calendar year 1900, fell short of that of the preceding year by \$221,306. Had it not been for a slight increase in the items of iron, slate and brick, this decrease would have reached \$251,379.

TABLE I.
Mineral Production for the Calendar Year 1900.

NAME OF PRODUCT.	QUANTITY.	VALUE.
*Brick	800,000	\$11,200 00
Building Stone.....	500 tons	500 00
Cobble Stone.....		500 00
Copper Ore	70,614 tons	399,775 00
Gold.....	2,400 ozs.	49,608 00
Granite		2,500 00
Iron Ore.....	317,216 tons	317,216 00
Slate.....	600 tons	10,800 00
	Total	\$792,099 00

TABLE II.
Showing Increase and Decrease in 1900 as Compared with 1899.

PRODUCT.	QUANTITY.		VALUE	
	Increase.	Decrease.	Increase.	Decrease.
Brick	28,000		2,736	
Building Stone.....				
Chrome Ore.....		706 tons		\$ 10,399 00
Coal.....		5,000 tons		20,000 00
Copper Ore.....		16,342 tons		60,749 00
Gold.....	335 ozs.		6,718	
Granite.....				2,500 00
Iron Ore.....	10,336 tons		10,336	
Mica.....		23 tons		660 00
Paving Stone				27,700 00
Pyrites.....		25,954 tons		129,770 00
Slate.....	600 tons		10,800	

*No returns were received from the other Brick yards in Smith's Sound. Their average output used to be about 120,000, worth at yard, \$240.00.

NOTES ON THE OCCURRENCE OF VARIOUS MINERAL SUBSTANCES, AND UPON RECENT DISCOVERIES, &c.

ABRASIVE MATERIALS.

Under this head are included such materials as grindstones, whetstones, scythe stones, stones used in the manufacture of wood pulp, &c. all of which occur in abundance in some parts of the Island, notably amongst the Carboniferous Series along the West coast and at Grand Lake. Coarse Garnets are plentiful in some of the mica schists. When crushed into fine powder, the material is used in cutting and polishing other rocks or as a substitute for emery. Its degree of hardness is however inferior to that of Corundum, or emery proper. This latter mineral has not yet come under my observation as occurring in this country, but there is no good reason why it should not be found some day amongst the Archaean series, of which a great portion of the Island is composed.

AGALMATOLITE.

This peculiar substance or something nearly approaching it is known to exist in large quantity a few miles inside of Manuels on the Southside of Conception Bay. Owing to the ease with which it can be cut with any ordinary implement, it has been given the name of figure-stone. The Indians of America, the Chinese and other people carve from it, pipes, images, and ornamental articles of various kinds, hence the name. It is composed of silica, alumina, potash, and water. It does not contain magnesia, yet has the unctuous feel of magnesian substances. When ground, the powder produced is beautifully white, and experiments have been made, I understand, with it as a paper filler, but with what result I am not aware. That it will sooner or later be found to serve some useful purpose seems most probable.

ANTHRAXOLITE.

Anthraxolite which is believed to be an altered product of Petroleum or asphalt in a crystalized condition, occurs in trap dykes cutting the petroliferous shales in Port-a-Port Bay. It is a jet black lustrous material not unlike Albertite in appearance, and contains a large amount of fixed carbon. It is not an abundant

mineral though some fairly large veins of it are said to exist on Labrador. It has been experimented with as a possible source of fuel, but with what success I have not learned. Ground into an impalpable powder and mixed with oil it has been used as a black paint. Possibly it might be made to take the place of jet in jewelry.

ANTIMONY (*Stibnite*.)

This valuable mineral substance does not seem to have received that attention its importance deserves. It occurs at several places in Notre Dame Bay, and at Moreton's Harbor in New World Island quite a promising deposit was worked for a short time, and during the years 1890 and 1891, ore to the value of \$2,200 was sent to market. I visited and inspected this property in 1898, and was very favorably impressed with it, yet nothing has since been done to develop it. The crude ores of Antimony, both in the European and American markets of late years, have not been equal to meet the demand, the price of raw ore in London reached £37 Stg. in July 1898. In view of these facts the present would seem a very favorable time to exploit this promising property.

ASPHALTUM.

A small specimen of mineral tar or asphalt was shown me last autumn as being derived from the hydro-carbonaceous shales of the Northern Peninsula. I merely mention it here as an addition to the number of mineral species occurring in the Island, as coming under my notice for the first time. It is simply another form of Petroleum, but I do not anticipate its existence in economic quantity. Were such the case it should prove a very valuable addition to the mineral resources of the country.

ASBESTOS.

Asbestos is known to be quite a common mineral substance in association with the serpentine deposits of the country. The fibre though usually short, sometimes attains considerable length, and is apparently of very good quality. The property owned by the Hon. R. Bond near George's Pond was at one time operated by the John's Asbestos Co., of New York, but owing to the then difficult and expensive means of transportation, work was abandoned

after a short while. Now that all this is changed by the construction of the Railway, which passes within a couple of miles of the locality, it is probable that ere long, this, like many hitherto almost inaccessible mineral properties, will soon receive attention. Asbestos of good quality also occurs at Bluff Head and other parts of Port a Port Bay, and as the serpentine areas of the Island become more thoroughly prospected it is but reasonable to expect that many new finds of this useful substance will be brought to light.

BARITE.

Barite as a vein material associated with other gangues such as fluor and calc-spar is not uncommon. It is usually, however, tinged with per-oxide of iron which effects it injuriously as a marketable commodity. A large vein of this character occurs near St. Bride's in Placentia Bay. I have seen some specimens of pure white Barite both from the Island and Labrador coast, but whether it exists in economic quantity I am unable to say. It is chiefly used, when ground into powder as a pigment also to a limited extent in pyrotechny, and when treated with sulphuric acid and converted into barium sulphate for a few other purposes. The chief manufactories of barites products in the United States are situated at Chicago and St Louis, where the raw material in 1898 cost the grinders \$7.25 per ton of 2,240 lbs. Its selling price at the mines in Washington County, Mo., was about \$4.50 per ton. These prices considering the ease with which the material can be mined are good, and should serve as an inducement to prospectors to search for the mineral.

CEMENT.

Cement though properly speaking an artificial product never the less does occur in nature in the form of natural rock cement and there is every reason to believe we possess an abundance of the material here. The manufacture of Portland cement is a growing industry of immense proportions, both in the United States and Canada, where the supply is not at all equal to the demand of late years. Our own importation of this most necessary and useful material is growing apace, and its home manufacture might be well worthy the consideration of some of our local capitalists. Some

the lime-stones of the country, especially those containing more or less magnesia, iron, manganese &c., would undoubtedly produce good hydraulic cement. Some of the lime-stones of Conception, Placentia, and Trinity Bays are of this character.

COAL.

It is much to be regretted that the attempt to operate the coal deposits at Grand Lake has not been attended with that degree of success which was anticipated. The failure to establish a coal mining industry in that locality has unfortunately tended to engender a considerable amount of unbelief in our coal resources generally, not at all warranted by the facts which have been, from time to time, brought to light.

It is nothing new in the history of coal mining, or for that matter in any other species of mining, where unscientific methods of procedure are employed. Many promising properties are thus condemned by the absence of a sufficient knowledge of the geological structure, and mineralogical conditions pertaining to the particular district, and the modes of occurrence of the product sought for.

In this connection, I cannot do better than quote from an admirable paper on "Mining" by A. J. Bensusan, A.R.S.M., F.C.S., read before the New South Wales Chamber of Mines, January last.

Speaking of mine management, the author says:

"I shall be glad to see the day when most of the men managing our mines all over this country retire in favour of trained engineers, when we will then hear of fewer failures, and of people investing in mining knowing that they will have at least a fair run or their money.

"The employment in managerial positions of the so-called 'practical' man, and I use the word practical advisedly, is one of the greatest drawbacks from which the industry suffers. He is generally a miner who has been cute enough to raise his status by first becoming a shift boss, then foreman of a mine, then perhaps manager of some concern, and finally he takes responsibilities far beyond his capacity, with the result that he almost invariably ruins the mine, and not infrequently those who have found the money for the work.

"The management of mines now-a-days should be in the hands of the most highly trained and educated men available.

"Good mines are frequently abandoned, and work continued at the bad ones, from the incompetence of those usually placed in charge.

"Good men command comparatively high salaries, but they are usually able to save the cost to their employers several times over by not spending money in useless ways."

The above quotations go to prove that mining ventures, like all other undertakings, may be easily rendered successes or failures, not always through the lack of mineral, but through incompetency and mismanagement. This country has unfortunately witnessed much of this sort of thing in the past, and its damaging effect in the eyes of capitalists has been of a most injurious character.

The proneness to enter upon elaborate works, purchase expensive and unnecessary machinery, etc., before first ascertaining the extent and character of the deposits, has been a fruitful cause of so many mining failures.

The Coal area of Grand Lake should have been thoroughly tested by means of the boring drill before any attempt at actual mining was entered upon, and this applies equally to the coal area of St George's Bay. This latter as has been frequently asserted, is so far as the surface indications have been ascertained of a most promising character. Yet it would be most certainly advisable as a preliminary to mining the coal here, to use the boring rod extensively. Such is the nature of the surface covering the coal beds, and so few are the rock exposures to be met with, that it is only by such means the extent and importance of this coal field can be determined with any degree of accuracy.

CHROMITE.

No shipments of Chromic iron were made from the Bluff Head Mine last year, and operations were suspended during the summer for causes of which I am not cognizant. During the same season some important new finds of this class of ore have been made, one on the inner side of the Louis Hill range of Port a Port, which is reported as being a large deposit. In the vicinity of Pipe Stone Pond on the Bay D'Est River another extensive de-

posit has been located and staked in. Both these latter localities are situated some considerable distance from the sea-board, and will require roads or tramways for the transportation of the ore to the shore. If the deposits are at all in keeping with the reports, especially as the specimens procured are of a high grade ore, there should be no great difficulty in exploiting these properties. Chromite is in demand, and the low grade ores heretofore of little value are now, by means of concentration, easily brought up to a marketable condition. Formerly this substance was exclusively used in the arts, for the purpose of which only high grades were saleable. Now, however, other uses have been found for the ores, such as furnace linings and for the manufacture of ferro-chromium, chrome steel, &c. It is said to give to the steel such hardening properties as to afford some of the best material for edged tools, where excessive hardness is required.

COBBLE STONE.

Under this head is included the worn beach stones used somewhat extensively by the Municipal authorities for paving purposes and side-drains throughout the city. Some \$500 or \$600 worth are purchased annually for these purposes.

COPPER.

The operations of the Cape Copper Co., at Tilt Cove last year again proved highly successful, as may be seen from the accompanying tables. This valuable property is holding its own notwithstanding its continuous operation, now extending over the past 36 years, and the reserve of ore still in sight according to the Company's report for the fiscal year ending August 31st, 1900, was as follows: East Mine 203,692 tons; West Mine 487½ making a total of 204,179½ tons. The mine produced a gross profit for the year of £66,349 12s 5d equal to \$318,478.18.

Although much of the ore now being won from the East Mine is a low grade sulphuret not exceeding 3½ per cent. in metallic copper, still the high prices ruling during the past few years, and the presence of a variable yet economic amount of the precious metals, Gold and Silver contained therein, has resulted in a splendid margin of profit for the Company. The ore of the old West Mine, though small in quantity, is of much higher grade averaging

11 per cent. copper, and this tends to add considerably to the value of the output.

So far as I can learn no copper ore was shipped from any other mine except Tilt Cove last year, but as previously stated there were several small quantities mined at various points, most of which will probably be marketed the coming season.

The York Harbor copper mine under the able management of Mr. James Hooper is being put in good working condition. The 500 tons of ore raised up to last autumn has not yet been shipped, the preliminary work of constructing a tramway from the mine to the shore not being completed before the close of navigation last year, prevented doing so. This, together with the winter's output will probably be marketed the coming summer.

New copper finds have been made recently in Conception and Placentia Bays, amongst the Huronian series hitherto not exploited for copper to any extent. As in the Lake Superior district of Canada, and the Northern States of the American Union, the ores accompanying these ancient series are generally rich sulphurets, such as Chalcocite, Chalcopyrite, Bornite etc. Cuprite and Native Copper are also present, and though usually sparsely disseminated in the rock mass, their exceeding richness has proved an inducement to attempt mining ores showing less than 1 per cent. of metal.

In the Keweenaw mining region of Northern Michigan, where has taken place the greatest development of native copper in the world's history, the richest mine in operation, the Calumet and Hecla, averages only about 3.05 per cent. cu. None of the other mines of the region exceed 2 per cent. on an average, and several give much lower return, the Atlantic Mine actually treating ore of only 0.61 per cent. with profit.

Mr. R. McGrath, M.H.A., has made a discovery of native copper on Oderin Island in Placentia Bay, which seems to promise well. The metal is contained chiefly in an amygdaloidal trap rock or igneous overflow, though it is found also in quartz and calcareous veins cutting the latter, in some cases in the form of mass copper. Lumps ranging from a few ounces up to 55 lbs. in weight, and which averaged at least 75 per cent. metal, were procured from some of the veins. Some development work is being carried

out during the winter under Mr. McGrath's supervision, and new finds are being made from time to time.

The geological conditions, judging from the character of the rocks, would appear to be almost identical with those pertaining to the Lake Superior region, and there is reason to believe that this cupriferous series also is about in the same geological horizon.

Millions have been expended in exploiting the Lake Superior mines, and frequent failures have attended the initial operations in most instances, but the rich corporations which have persistently carried on the work, and have brought the treatment of this class of ore down to a fine science, have usually had their efforts crowned with success in the end. To-day the Lake copper region stands first in the world as a producer of the metal, and Lake copper is the standard by which the price of the metal is governed in the principal markets.

Metallic or Native Copper is known to exist in other parts of this country, and has been frequently referred to in former reports. I might here draw attention to the importance which might attach to a close study of the conditions under which this metal occurs with a view to applying the knowledge to other parts. It appears to me that such an investigation might have a very important bearing upon the future mining prosperity of the country. Could it be definitely determined that our rock series were really identical with those of Lake Superior, and that the copper occurred under exactly similar conditions, the tracing out and mapping of the cupriferous belts or zones, could scarcely fail to be of immense advantage to the prospector.

FELDSPAR.

Feldspar is an abundant and common mineral amongst the Archæan series, frequently in the form of large veins penetrating the gneiss and mica schist. It is used extensively in the manufacture of china and porcelain ware, and as a glaze on the surfaces of ordinary earthenware. There are many varieties of the mineral, but only those free from iron and other impurities are in requisition.

FLUORSPAR.

Fluor- which is worth from \$6.00 to \$7.00 in the raw

state is used chiefly in the production of Fluorhydric Acid and as a flux in metallurgical smelting. The acid is especially useful in cleansing iron castings for which purposes it is expected to supercede all other acids. The business of manufacturing it, is growing in importance each year, and there would appear to be quite a future before it. The material occurs as a gangue or veinstuff in several localities, and is that which carried the Native Silver at Lawn in Placentia Bay.

GOLD.

No returns of the amount of gold extracted from the Tilt Cove ores have been forthcoming the last two years,* but it is presumable it has averaged much about the same per ton of ore smelted as heretofore, viz., 1.5 dwts. Nothing definite appears to have been accomplished at the Rose Blanche properties during the year. Reports of various lots of quartz having been sent away as test samples have appeared from time to time, but with what results I have been unable to ascertain.† That there is a vast amount of quartz in the locality and that it contains some gold has I believe been satisfactorily determined. In all such cases where assays show encouraging prospects systematic prospecting by persons understanding the business should be entered upon. No one can doubt the existence of gold in this country, but it is not every person, nor yet every prospector, who is sufficiently qualified and experienced to enter upon gold prospecting per se.

GRAPHITE.

Graphite or Plumbago is another mineral substance not uncommon in the Island, but the manufacture of artificial graphite from coke is now superceding the natural product in the markets to a considerable extent. The uses of graphite are too well known to require mention here.

GRANITE.

I could obtain no returns from the Topsail Granite Quarries for the past year, but was informed indirectly that some 600 tons

*Since the above was written the returns have been received (see tables).

†Quite recently most favourable assays have been received.

had been taken out most of which was used in the constructing of the new R. R. bridge over the Exploits River. Mr. W. Ellis who has entered into a contract for supplying granite to be used in the construction of the new Court House informs me that his output from the quarry at Petites amounted to about \$2,500.00 worth last season. The utilization of this durable and handsome rock in the new building will I have no doubt prove a standing advertisement of the superiority of the native material over any imported article of the kind.

GYPSUM.

The immense deposits of this material in the District of Bay St. George still remain unproductive. Between the years 1891 and 1894 gypsum to the value of \$4,300.00 was exported to the United States from the above mentioned locality, but since then nothing further has been done to develop the industry. That there is practically an inexhaustible quantity of gypsum of excellent quality in the region in question has been frequently set forth in former reports, and there is no adequate reason why these deposits should not be contributing to the mineral production of the country. In Canada in 1898 gypsum to the value of \$232,515.00 was quarried and sent to market.

IRON.

The Bell Island Iron Mines scarcely need any reference, their great value and importance being now a matter of world wide fame. The enormous quantity of ore so unique in the character of its mode of occurrence, so easily and cheaply mined, and its proved adaptability for the manufacture of first class pig iron and steel has established for the ore a reputation which is likely to hold. Last year the Dominion Iron and Steel Company who had purchased the principal ore band from the Nova Scotia Steel Co., commenced active operations and were preparing to ship large quantities of ore to their new reducing works at Sydney, C. B., while the latter company began to operate the upper band of ore, and had constructed a new tramway and pier for loading purposes further west on the Island. The strike of the miners referred to previously in this report greatly retarded the work on both mines however, with the result shown. Now that all differences

have been adjusted there is every prospect of a vast increase in the output from both mines the present season. Already several cargoes of ore have been shipped off at a much earlier season than usual. The gigantic proportions of the new smelting works at Sydney and the vast possibilities outlined for its future is intimately associated with our own iron ore development seeing that these works are dependent to a great extent for their supply of the raw material from this country. Might it not be a very pertinent question to ask in view of these facts why Newfoundland should not have a similar industry established. Iron ores are not confined to Bell Island by any means. They are about the most universally distributed minerals we possess. New finds are constantly being made, and the enormous bodies of Magnetite known to exist on the western side of the Island in close proximity to our best Coal deposits should, if properly exploited, prove an incentive to capitalists to enter upon such an industry here.

A recent writer on the subject of the "Future of the Iron and Steel Industry," in the Canadian Mining Review for April, 1901, speaking of the growing increase in the consumption of pig-iron of late years, and of the outlook for this industry in the near future, predicts an enormous demand, probably reaching not less than 60,000,000 tons within the next decade. "Viewing the situation on the North American continent," the writer affirms that, "the United States must supply the greater part of this increase in the world's output." Concerning Canada he says: "The recent opening of vast deposits of rich steel ores in the Maritime provinces of Canada, close to deep water, may enable Great Britain to keep in line, but as these deposits are adjacent to abundant deposits of coking coal and limestone, perhaps British iron and steel works may have to be in part removed to this continent in order to continue."

Were we in a position to offer a small bounty upon the production of pig-iron in the Colony, manufactured from our own ores, the day might not be far distant when we would see smelting works erected at the most favorable localities, and who can doubt what the effect would be upon the building up of the prosperity of the country. It is by such a fostering policy that the Dominion Government, a few years since gave an impetus to an

iron manufacturing industry which is growing rapidly within its borders and is destined to become one of the chief factors in the building up of this vast new world Empire.

LEAD.

Ores of lead chiefly Galena, are known to occur at many points and in most of the great bays indenting the coast line. Several attempts have been made from time to time to establish mines of this ore, the most notable being those at La Manche, Lawn and Little Placentia, in Placentia Bay. The first and last named seemed to give every promise of being really good properties. Between the years 1857 and 1868 some 2,375 tons of galena were extracted from the La Manche Mine which was a yield of 2.37 tons per fathom of ground excavated. The ore occurs in a well defined fissure vein of mixed calc and fluorspar, with a little quartz and sulphate of barytes, and it averaged about 3 feet in width. Its attitude was nearly vertical and it runs very straight, and with great persistency for a mile or more. The only time I ever visited this mine was in 1868, in company with the late Alexander Murray, C.M.G., F.G.S. This was shortly before it closed down. I then made a cursory inspection of the underground works and to all appearances it gave me the impression of being a very valuable deposit. The Silver Cliff Mine at Little Placentia, was operated for a few years only and then abandoned. A few desultory attempts were subsequently made to re-open it, but it has now been closed for the past two years. This ore proved to be highly argentiferous, some specimens yielding as much as 336 ozs. of silver per ton. The prospects of this mine, like those of La Manche, certainly at one time looked most favourable, and I am greatly inclined to the opinion that in both cases, it was not so much the absence of paying quantities of ore that occasioned the closing down, as that already adverted to, much to be regretted, absence of skilled scientific management.

MANGANESE.

The low grade Manganese deposits on the South side of Conception Bay are at length receiving attention. The adaptability of this class of ore to the manufacture of spegeleisen and ferromanganese, two substances now largely used in the production of

the better classes of steel, has directed the attention of the Dominion Steel Co., to this convenient source of supply, in connection with their operations at Bell Island. Should the ore on trial, prove suitable for the purpose, a new industry will shortly be established in Conception Bay, bidding fair to equal that of Bell Island. Already several men are at work opening up the deposits, and the latest reports from the locality are of the most favorable nature.

Manganese is a mineral that may be reasonably looked for in several other districts of the country, as its presence is frequently indicated by coatings of oxide covering the rocks at many points. Wad or bog manganese may be seen on the surface of the ground in a great many places, and is often encountered amongst the debris in the beds of shallow streams. The deposit of mixed iron and manganese at Fortune Harbor, Notre Dame Bay, from which a shipment of 1,500 tons was made in 1897, has I understand been leased by the Newfoundland Exploration Company from Mr. W. Cook, and is again about to be operated. It is to be hoped this new venture will prove more successful than the former attempt.

MISPICKEL.

Mispickel or Arsenical pyrites is a mineral substance of very common occurrence and usually contains a small percentage of gold. The extraction of the precious metal is however difficult owing to the refractory nature of the compound. The treatment of such ores requires an expensive process, and unless gold to paying quantity is present, few capitalists are likely to handle it. In this however, as in other metallurgical operations, science is every day discovering new modes of treatment, and it goes without saying that ere long it will succeed in economically extracting from all these baser refractory substances their gold and silver contents.

Some years ago Capt. Stewart opened up a large lode of Arsenical pyrites ore at Moreton's Harbor, New World Island, N. D. B. An assay of this ore by Martin & Pettybridge of London, England, gave the following result:

Silica	3.98 per cent.
Lime	.97
Phosphoric Anhydride	.14

Manganese Dioxide	2.39		
Metallic Iron	47.64		
Sulphur	29.11		
Metallic Arsenic	15.717		
Loss	2.28		
	ozs.	dwts.	grs.
Gold per ton	0	7	14
Silver per ton	0	18	9

A small shipment of this ore was made in 1897, but no returns were received. During last winter Capt. Stewart has been again at work sinking a shaft upon the lode, and by last accounts was down about 108 or 110 feet. The lode is reported to have averaged 18 inches solid ore throughout.

MOLYBDENITE.

This mineral which is somewhat rare, at least in large deposits, is found at a few places in this Island. Some enquiries in reference to it were directed to me during the past year. The metal Molybdenum extracted from this ore, is now taking the place of Tungsten in the manufacture of certain special high class steels. Ferromolybdenum or its combination with iron is now an article of regular production in the United States. The steel produced therefrom as well as the Tungsten steel, is chiefly employed in the manufacture of cutting tools where extra hard material is required. Tests made with both the above mentioned substances have given varying results, but it is conceded that molybdenum possesses many qualities which render it fully equal to if not superior to Tungsten. It is therefore likely ere long, to take the place of the latter expensive and comparatively rare material in the market.

NICKEL.

Between the years 1860 and 1876 some 11 tons of Nickel ore were shipped from the Tilt Cove Mine, valued at \$32,740.00. Since that time there have been no returns of any further shipments either from this or any other locality in the Island. The Pyrrhotite or magnetic pyrites ores which occur abundantly in many parts of Notre Dame Bay and elsewhere, have proved by analysis to be with few exceptions nickeliferous. Although the

per centage of metallic nickel is usually small, not showing a sufficient amount to render the ores commercially valuable, still its presence at all should prove an incentive to prospectors to look more closely after this class of ore, when better results may be attained.

The great Nickel industry of Sudbury in Canada is founded upon the occurrence of similar nickeliferous pyrrhotite, whose tenor in nickel ranges from 2 to 5 per cent. only, and averages but 3.52 per cent. Whether any of our ores come up to this figure, is a matter which can only be determined by an extensive series of analysis of specimens from many different localities.

PEAT.

Peat, properly speaking is a purely vegetable substance, but as an economic material is usually classed with minerals, as are Coal, Petroleum, etc. The question of substituting peat for fuel in lieu of coal, at all events for domestic purposes, is one that has long occupied the attention of the inhabitants of countries where coal is either absent altogether, or otherwise scarce. Such countries possess an abundance of peat and as its chief constituents are to all intents similar, it only remains for man's ingenuity to perfect and put in operation some apparatus which is able to effect, in a small way, what nature has done on the larger scale in the production of coal. The rapidly increasing consumption of the latter for smelting purposes indicates the approach of a period when as a household fuel it will be of such an expensive character, as to preclude its use, except by the wealthy. This stage has already been reached in many countries, and here in Newfoundland, it is a very serious matter to contemplate, especially in view of the rapid depletion of our forests. Necessity will compel us ere long to turn our attention to some other source of fuel for domestic purposes, and it is clearly to our abundant supply of peat we will have to turn.

The manufacture of peat fuel, it is claimed, is now placed beyond the experimental stage. In Holland, Denmark, Germany and other European countries, many apparatus for this purpose have been patented, each of which has its particular merits. Possibly a combination of them may produce machines having all the requirements sought for. By some of these patents it has been pos-

sible to produce peat coal which compared favorably with ordinary bitumenous coal, but this process is said to be too expensive, and moreover the peat was found to lose some of its calorific value.

A peat briquette factory in Pomerania, Prussia, claims to be a complete success. This factory, says "The Mineral Industry," turns out 80 briquettes per minute, or 35 tons per day, with an average output of about 12,775 tons per annum, and the demand is far greater than the supply. The cost of production is about \$1.70 a ton, and it is believed with larger plant it can be reduced to about \$1.20.

In Canada, the Trent Valley Peat-fuel Co., and several other smaller concerns have been experimenting the past few years, and some claim complete success. New patents, and improvements on old ones have been taken out, of which that machine known as Dickson's patent appears to possess almost all the necessary requirements. It is claimed here again, by some of the fuel manufacturers that they can produce for at least \$1.00 per ton if not less. One individual, in reply to queries addressed to him by the Mining Bureau of Ontario, says he has no difficulty in finding a ready market for all he can produce. He gets \$3.00 per ton at the works, and adds that his customers think well of the fuel. Some who use this material consider it as good as coal and prefer it because of the absence of smoke and clinker. One thing which has been satisfactorily determined with regard to this peat fuel is, that while it can scarcely be claimed that it comes up to the better qualities of household coals for domestic purposes, yet its calorific value exceeds that of wood, and is fully equal to much of the coal in ordinary use.

The Bureau of Mines of Ontario have now detailed a specialist to enquire into the whole question of the peat fuel industry in that Province, which they consider one of very great importance, especially in view of the fact that they possess no coal resources of their own. This report when completed, will not doubt prove to be one of very great interest, and as I have been promised a copy of it, I am looking forward with much pleasure to its perusal.

In the meantime I would like to draw the special attention of our local capitalists to this matter. It does appear to me that in this direction a very promising opening presents itself for the in-

vestment of money, with coal at almost prohibitive prices in our markets, and very little prospect of its being any cheaper in the near future.

Could a fuel, at least equal to the inferior qualities of foreign imported coal, be placed upon our markets at reasonable prices, say from \$2.50 to \$3.00 per ton, it would prove a great boon to the poor, and could scarcely fail to furnish a nice margin of profit to the investors. The plant required for its manufacture is simple and inexpensive. The same person who furnished the Bureau of Mines with the information quoted above, also states that his plant could be duplicated for \$8,000.00.

Peat serves many other useful purposes besides that of fuel, and is extensively utilized in some of the continental countries of Europe, where it is an article of considerable commercial value. The half decomposed fibrous, upper layers of the peat bogs, when thoroughly dried, make the very choicest litter for cattle. Its absorbent quality tends to keep the animals clean and dry, while the same property, when used in stables, renders it a valuable fertilizer. It also possesses disinfecting properties and is utilized with good effect as an antiseptic in hospitals, etc.

To enumerate all the possibilities of this valuable, yet heretofore much despised gift of Nature, would be beyond the limits of this report. It is sufficient to say that its utility is becoming more and more fully recognized, every year, and in Canada it is expected ere long to take an important place in connection with the industrial pursuits of the country.

PETROLEUM.

No direct information could be obtained of the boring operations at Port a Port, for the past year or two, and it is only through reference to the reports of the United States Geological Survey, that I can obtain anything definite. According to this report, "There were four wells drilled in 1898. Three of these struck oil at from 136 to 684 feet in moderate quantities. The shallow well is said to have produced ten barrels per day for a month. The colour of the oil is dark amber, the gravity 33° Baume, and it seems to have good lubricating qualities."

The Parson's Pond Oil Company engaged the services of an expert oil driller last season, and purchased a new outfit of the

latest and most approved pattern, with the intention of carrying out extensive boring operations on their claims. Owing to unlooked for delay in the delivery of the machinery, and the consequent lateness of the season when all was safely deposited upon the ground, the expert concluded it would be preferable to await another season before beginning work. He has recently returned to this country and is now I believe on the ground. Great hopes are entertained of a successful issue from this present attempt, with much probability of their being realized. The three wells previously bored in this locality all showed oil in greater or less quantity. The first after being shot, is said to have yielded 18 barrels of oil in the space of some forty or fifty minutes pumping.

There can be no doubt now, that the pyro schists at the base of the Silurian series, along the Western coast of this Island are frequently oil bearing, but to what extent has yet to be determined. Judging from the few trial borings that have so far been made, they certainly give fair promise of eventually turning out productive. So far as I can learn no well yet sunk in these schists has failed to show some sign of oil, and when it is considered that in Canada even the best wells do not average a barrel per day of 24 hours (in the case of the Petrolia oil field it is less than one-quarter of a barrel daily) there is good reason to look forward with hope to the future of our local oil fields. According to the latest Canadian statistics at hand, I find that there are 7,000 wells in the Petrolia fields, 1,600 in Oil Springs field, their combined production approximating 57,000 barrels per month or about 6.63 barrels per individual well. The other smaller oil fields in the same neighborhood do not even come up to this yield, but of course the annual production of all combined is in the aggregate a large output.

PYRITE.

As has already been stated the closing down of the Pilley's Island Pyrite Mine caused a very marked deficit in the value of our mineral products last year. An attempt has recently been made to re-open this mine by the Newfoundland Exploration Co., with what results remains to be seen. The same company have leased the old Terra Nova Mine at Bay Verte, where a large body of pyrites carrying about $1\frac{1}{2}$ per cent. of copper is known to exist. It

is more than likely this property will be operated the coming season.

Pyrites, fairly high in Sulphur is a common mineral, and may be encountered in almost every district of the Island, and we may fairly assume that other mines of this ore will be established in course of time. It is reported also as an abundant mineral on Labrador, and one property at least is about to be opened up there this summer.

SALT.

Saline springs are of frequent occurrence amongst the Lower Carboniferous series in the district of Bay St. George, more especially in the neighborhood of the gypsiferous deposits, with which they seem to have an intimate connection. Some of those springs are intensely saline, and their overflow causes a coating of fine white salt to be deposited upon the rock surfaces in their vicinity, by the evaporation of the water during the dry summer season. I believe much salt could be obtained from this source by a proper system of treatment of the brine. Possibly deposits of rock salt underlie these springs. Even so now a days, it is found more economical in most cases to dissolve out the salt from such deposits, pump it into tanks, purify it by the addition of calcium chloride, filtre and evaporate it in specially provided pans, and then dry it for market.

There appears no good reason why a small but paying industry might not be established in the preparation of this useful article of consumption in the district referred to.

SLATE.

The revival of the slate industry in Smith's Sound last year, was due chiefly to the visit of Prof. Walcott to this country the previous season. He was so taken with the superior quality of the slate in that section, that upon his return to the United States he brought its merits before some of the slate manufacturers there, with the result that Mr. Willis the present owner of the property came down to inspect it, and shortly afterwards purchased out the quarries from the original owners.

These slates belong to the Lower Cambrian series of rocks, the same in which the celebrated Carnarvan slates occur, and from

whence also some of the best material in the United States is derived. The series occupies several extensive areas in Newfoundland, and it is not reasonable to expect the occurrence of good roofing material at other points of their distribution.

Last year, as may be seen by the tabular statement, some 600 tons were shipped to the London market, which I am informed met with a ready sale. Operations are now being prosecuted vigorously at the Quarries in Smith's Sound, and the coming season will no doubt witness a largely increased output. The colour of this slate is chiefly dark purple inclining to red, but there is also in the same locality a smaller proportion of unfading green slate which fetches a higher price, and is looked upon with much favor.

STONE.

Stone fit for building, structural and ornamental purposes is abundant in many parts of the Island. Sandstones of many colours, and various degrees of texture are very common in the Lower Carboniferous series of Codroy and Bay St. George districts. Limestones also abound in the same region, some of which would make handsome marbles, while others are well adapted for burning into lime. Serpentine of many varieties, and often of great beauty are met with amongst the Mesozoic group or metamorphic series, wherever the latter attain any considerable development. A very beautiful green variety, of an attractive appearance, admirable for ornamental purposes, comes from Tilt Cove in the vicinity of the copper mine. The well known Signal Hill stone near St. John's is extensively used for building purposes, and for rough work can scarcely be excelled. An infinite variety of other stones suitable for almost any purpose to which stone can be applied, exists in many parts of the Island, and the time must soon arrive when the importation of stone for structural work of any kind should cease.

SOAPSTONE.

Many varieties of this useful material exist in connection with the serpentine deposits, which occupy such large tracts of the country, and seeing the many useful purposes to which it is applied in other countries there should be a market for at least the better qualities of steatite, etc., both in Europe and America.

TITANITE.

A beautiful specimen of this material has recently been presented to the Museum by Mr. Piopy of this city, which came from the Labrador. Although of no present commercial importance, for economic purposes, titanitic acid is used to a small extent in the arts, and recent experiments with titanium in combination with aluminum, chromium, and copper produced some very hard and tough alloys. Possibly in this and similar directions, a use will be found ere long for the material. There are other ores of titanium such as Rutile and Ilmenite found in the neighborhood of White Bay, but they are of somewhat rare occurrence. The former has been employed in painting on porcelain, and in giving the requisite colour and enamel appearance to artificial teeth.

ZINC.

Ores of zinc such as blende, sphalerite, calamine are known to exist at several points, but so far but little attention has been paid to them, and whether they occur in economic quantities or not has never been determined. Zinc is a very useful and valuable material and the demand for the raw material is in excess of the supply in all the markets. This fact should stimulate prospectors to search diligently for the ores, which there is reason to believe this country will eventually number amongst its valuable natural products.

MISCELLANEOUS PRODUCTS.

There are many such which as yet with few exceptions have not been brought into practical utility. Clays suitable for brick and tile manufacture abound. Fire clays, terra-cotta, and kaolin are known to exist, the two former being of frequent occurrence amongst the Carboniferous series on the West side of the Island. Lithographic stone of good quality has also been obtained from the same series. Limestone suitable for burning into lime and fluxing metallic ores is abundant. Some of this stone has been utilized for many years for the above purposes, but I never could obtain any reliable returns as to the amount or value. Sand of all colours and of various degrees of fineness possessing all the requisites for the manufacture into cement mortar, etc., may be encountered in almost every section of the Island. In the immediate vicinity of the Grand Lake there is an enormous depth of fine sand, some

of which would evidently serve the purpose of triplite. Mica and phosphate rock or Apatite have only been found in small quantity as yet, but no systematic search has ever been instituted for either of these substances, nor is there any reason why they may not occur in paying quantity.

Materials applicable to the fine arts and for jewellery are not uncommon. Red and yellow ochres, as well as other substances now largely used as pigments, are awaiting the enterprise of some person versed in their preparation to be turned to account.

Many beautiful ornamental stones may be encountered in various parts of the country, such as red, yellow and variegated jaspers, amethystine and opalescent quartz, handsome porphyries, syenites, traps, amygdaloids, and a variety of other rocks too numerous to specify. From time to time I have brought in many specimens of these, some of which have been given to jewellers and others who have had them cut and polished, and set in brooches, pins, pendants, or other forms of ornament. Some of the combinations produced were very beautiful, and it appears to me that quite a lucrative trade might be established in this line, could the materials be worked up in this country. The advent of so many tourists to the country of late years, and the certainty of an increased influx every succeeding year points to a possible large demand for souvenirs of this character. It might be well for some of our jewellers to turn their attention to this matter. A diamond cutting wheel for the preparation of the rough material can be had for a comparatively small figure.

I have the honor to be, Sir,

Your obedient servant,

JAMES P. HOWLEY.